

THE INVENTION CLAIMED IS:

1. A braking and back-up warning system for a vehicle having at least one wheel, said system comprising:

a brake mechanism;

5 a pneumatic control module connected to said brake mechanism;

electronic structure configured to perform a back-up warning function;

an electronic control module connected to said pneumatic control module and to said electronic structure; and

10 a wheel sensing arrangement connected to said electronic control module, said wheel sensing arrangement configured to sense movement of the wheel of the vehicle and configured to communicate information relating to that which is sensed by said wheel sensing arrangement to said electronic control module, said electronic control module configured to operate said pneumatic control module based on information which is received from said wheel sensing arrangement relating to a speed of the  
15 wheel which is sensed by said wheel sensing arrangement, said electronic control module configured to operate said electronic structure based on information which is received from said wheel sensing arrangement relating to a direction of the wheel which is sensed by said wheel sensing arrangement.

20 2. A system as defined in claim 1, said electronic structure comprising at least one of structure for sounding an audible alarm and a lamp.

3/ 25 3. A system as defined in claim 1, said wheel sensing arrangement comprising a circuit which includes at least one sensor configured to sense movement of the wheel, said circuit configured to provide at least one signal to said electronic control module relating to the speed of the wheel which is sensed by the circuit and provide at least one signal to said electronic control module relating to the direction of the wheel which is sensed by the circuit.

4. A system as defined in claim 3, wherein said circuit comprises an integrated circuit which includes at least one sensor configured to sense movement of the wheel.

5. A system as defined in claim 1, further comprising a voltage source, said electronic control module comprising a relay and configured to selectively operate said relay to connect said voltage source to said electronic structure which is configured to perform said back-up warning function.

6. A system as defined in claim 5, said electronic control module further comprising a controller which is configured to receive said information from said wheel sensing arrangement relating to the speed and direction of the wheel which is sensed by said wheel sensing arrangement.

7. A system as defined in claim 6, said electronic control module further comprising a transistor connected to said controller, said controller configured to actuate said transistor based on said information which is received from said wheel sensing arrangement relating to the direction of the wheel which is sensed by said wheel sensing arrangement, said transistor connected to said relay and configured to close said relay upon being actuated by said controller.

8. A system as defined in claim 5, wherein said voltage source is 12 volts provided by a J560 connector.

9. A system as defined in claim 1, further comprising a voltage source, said electronic control module configured to selectively connect said voltage source to said electronic structure which is configured to perform said back-up warning function, depending on the information which is received from said wheel sensing arrangement relating to the direction of the wheel which is sensed by said wheel sensing arrangement.

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10. A system as defined in claim 9, wherein said voltage source is 12 volts provided by a J560 connector.

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11. A braking and back-up warning system for a vehicle having at least one wheel, said system comprising:

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- a brake mechanism;
- a pneumatic control module connected to said brake mechanism;
- at least one of structure for sounding an audible alarm and a lamp;
- an electronic control module connected to said pneumatic control module and

to at least one of said structure for sounding an audible alarm and said lamp;

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- a voltage source connected to said electronic control module; and

a circuit which includes at least one sensor configured to sense movement of the wheel, said circuit configured to provide at least one signal to said electronic control module relating to the speed of the wheel which is sensed by said circuit and provide at least one signal to said electronic control module relating to the direction of the wheel which is sensed by said circuit, said electronic control module configured to operate said pneumatic control module based on said at least signal which is received from said circuit relating to a speed of the wheel which is sensed by said circuit, said electronic control module configured to selectively connect said voltage source to at least one of said structure for sounding an audible alarm and said lamp, depending on the at least one signal which is received from said circuit relating to the direction of the wheel which is sensed by said circuit.

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12. A system as defined in claim 11, wherein said circuit comprises an integrated circuit which includes at least one sensor configured to sense movement of the wheel.

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13. A system as defined in claim 11, said electronic control module comprises a relay and is configured to selectively operate said relay to connect said voltage source

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to at least of said structure for sounding an audible alarm and said lamp.

14. A system as defined in claim 11, said electronic control module further comprising a controller which is configured to receive said at least one signal from said wheel sensing arrangement relating to the speed and direction of the wheel which is sensed by said circuit.

25 15. A system as defined in claim 14, said electronic control module further comprising a transistor connected to said controller, said controller configured to actuate said transistor based on said at least one signal which is received from said circuit relating to the direction of the wheel which is sensed by said circuit, wherein said transistor is connected to said relay and is configured to close said relay upon being actuated by said controller.

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16. A system for a vehicle comprising:  
an axle;  
a wheel mounting assembly surrounding said axle;  
a wheel mounted on said wheel mounting assembly;  
an exciting element mounted on said wheel mounting assembly;  
a sensor member mounted on said axle, said sensor member having at least one sensing element mounted thereon for use in determining the speed of rotation of said wheel and for determining the direction of rotation of said wheel by sensing said exciting ring; and  
a controller for processing information from said sensor member regarding the speed of said wheel and the direction said wheel is rotating;  
circuit means for performing a function on the vehicle, said controller being capable of activating said circuit means.

17. A system as defined in claim 16, wherein two sensing elements are provided

on said sensor member and are spaced apart from each other a predetermined distance.

5 18. A system as defined in claim 16, wherein said at least one sensing element sinks current from said controller, and wherein the frequency at which said at least one sensing element sinks current from said controller is proportional to the speed of said wheel.

19. A system as defined in claim 16, wherein said exciting element includes a plurality of magnet poles.

10 20. A system as defined in claim 19, wherein two sensing elements are provided on said sensor member and are spaced apart from each other by an integral number of poles plus or minus approximately 90 degrees.

21. A system as defined in claim 16, wherein said circuit means includes a relay.

22. A system as defined in claim 16, wherein said controller is part of an anti-lock brake system or an electro-pneumatic brake system for the vehicle.

15 23. A system as defined in claim 16, wherein said controller includes a stored program which is capable of providing constant power to said circuit means to perform said function on said vehicle.

24. A system as defined in claim 23, wherein said function is a lamp being lit on the vehicle and/or an alarm being sounded on the vehicle.

20 25. A system as defined in claim 16, wherein said function is a lamp being lit on the vehicle and/or an alarm being sounded on the vehicle.

26. A system as defined in claim 16, wherein said at least one sensing element uses active sensing technology.

27. A system as defined in claim 26, wherein said at least one sensing element is a pair of hall effect semiconductor elements.

5 28. A system as defined in claim 27, wherein said pair of hall effect semiconductor elements are provided on one integrated circuit chip.

29. A system as defined in claim 27, wherein said exciting element is a ferrite magnet in a plastic carrier matrix.

10 30. A system as defined in claim 16, wherein power is supplied to said controller through a J560 connector.

31. A method of performing a function on a vehicle, such as lighting a lamp and/or sounding an alarm, comprising the steps of:  
sensing the direction of rotation of a wheel of said vehicle; and  
activating the function on said vehicle when said vehicle is in reverse.

15 32. A method as defined in claim 31, further including the step of sensing the speed of the wheel of said vehicle prior to activating the function on said vehicle when said vehicle is in reverse.

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